

Atty. Docket No. JP920000133US1  
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**REMARKS**

Applicants and the undersigned are most grateful for the time and efforts accorded the instant application by the Examiner. At the time of the Office Action dated March 20, 2007, claims 1-6, 8-12, and 14-20 were pending. Of the presently pending claims, claims 1, 4, 8, 9 and 14-20 are independent claims; the remaining claims are dependent claims. Claims 22 and 23 are newly presented. Thus, claims 1-6, 8-12, 14-20, and 22-23 are currently pending.

In response to the outstanding Office Action, claims 1, 4, 8, 9 and 14-20 have been amended. Applicants are not conceding in this application the claims amended herein are not patentable, as the present claim amendments are only for facilitating expeditious prosecution. Applicants respectfully reserve the right to pursue these and other claims in one or more continuations and/or divisional patent applications. Applicants specifically state no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Applicants respectfully request the Office to reconsider and withdraw the outstanding rejections in view of the following remarks.

**Rejections under 35 USC 103(a)**

Claims 1-6, 8, 9, and 15-20 stand rejected under 35 USC 103(a) as being unpatentable over Chelba et al., *Exploiting Syntactic Structure for Language Modeling*, Proceedings of Association for Computational Linguistics, Vol. ACL-36, Montreal, 1998,

Atty. Docket No. JP920000133US1  
(590.074)

(hereinafter "Chelba") in view of Dekai et al., *An Information-Theoretic Empirical Analysis of Dependency-Based Feature Types for Word Prediction Models*, EMNLPVLC-99, pp. 138-47, 1999 (hereinafter "Dekai"). Claims 10-12 stand rejected under 35 USC 103(a) as being unpatentable over Chelba in view of Dekai and further in view of Kuhn, *Speech Recognition and the Frequency of Recently Used Words: A Modified Markov Model for Natural Language*, 12<sup>th</sup> International Conference on Computing Linguistics (COLING-88), Budapest, 1988 (hereinafter "Kuhn"). For the following reasons, the Applicants respectfully submit the invention as presently claimed is fully distinguishable and non-obvious over the cited references.

As the Examiner is aware, to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 there must be: (1) a suggestion or motivation to modify a reference or combine references; (2) a reasonable expectation of success in making the modification or combination; and (3) a teaching or suggestion to one skilled in the art of all the claimed limitations of the invention to which the art is applied. See In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicants have taken great pains to fully disclose and explain the novelty of the present invention in view of the Chelba reference at the heart of the present rejections. For the sake of brevity, the remarks submitted in the last Amendment, dated January 3, 2007, equally applicable here, are incorporated by reference.

The Examiner now concedes that Chelba "does not teach a word sequence that has a modification relationship with said target word predicted." (Office Action, page 6). Rather, the Examiner cites Dekai as teaching "a word prediction method using

Atty. Docket No. JP920000133US1  
(590.074)

modification relationships between the target word and other words within the sequence (page 143)", therefore rendering the instantly claimed invention obvious when taken in combination with Chelba. *Id.* Applicants respectfully disagree for the following reasons.

As best understood, Dekai reviews the utility of various combinations of feature types inspired by both dependency structure and bigram structure, including the use of modifying words for word prediction, and proposes a preference ranking of the various features and combinations. (Abstract; see also pp. 145). However, Dekai is readily distinguishable from the presently claimed invention for, *inter alia*, the following reasons.

First, Dekai teaches using *single* words, either in a bigram structure or a dependency structure, to predict the target word, rather than using word phrases (i.e. partial analysis trees) to predict the target word. This is in stark contrast to the present invention, in which "the next word is predicted by using *the partial analysis tree* that has a modification relationship with the word to be predicted." (Specification, page 19, lines 6-7, emphasis added). Simply teaching the use of the previous *word* that has a modification relationship is not the same as teaching the use of the *partial analysis tree* that has a modification relationship.

Secondly, assuming, *arguendo*, that Chelba and Dekai are otherwise combinable art and that Dekai overcomes the deficiencies previously pointed out in Chelba, Dekai teaches away from (target) word prediction using a word with a modification relationship by favoring the use of the standard bigram structure by stating "4.5 Among the feature types in [nearest preceding word...nearest preceding word modifying the target

Atty. Docket No. JP920000133US1  
(590.074)

word...nearest word modified by the target word...] the preference order for selecting feature types is [nearest preceding word, nearest preceding word modified by the target word...nearest preceding word modifying the target word]." (Dekai, pp. 145). Thus, faced with a choice of a bigram (or trigram, as in Chelba) method or a modification related method, Dekai suggests choosing a standard bigram method over a method that takes into account the preceding modified word. Naturally, this is in stark contrast with the present invention in which "the next word is predicted by using the partial analysis tree that has a modification relationship with the word to be predicted." (Specification, page 19, lines 6-7).

Third, Dekai teaches away from disregarding the preceding word when it does not have a modification relationship, stating "if a language model uses only one feature type, feature type [nearest preceding word] should be used; if a language model uses two feature types, the feature type combination [nearest preceding word, nearest preceding word modified by the target word] should be used." (Dekai, pp. 146). Thus, even when a word having a modification relationship is utilized, the baseline preceding word (i.e. the "bigram" method) is still utilized in combination with this modifying word. Thus, this teaching stands in stark contrast to the instantly claimed invention, wherein the nearest preceding word *is not* taken into account *if it does not have a modification relationship* with the target word (i.e. the word to be predicted). (Specification, page 6, line 14-page 7, line 2 (stating "[t]herefore, according to the method proposed by Chelba...two immediately preceding head word[s]...are employed to predict the next word. When [the next word] is predicted...the sentence structure including [that next word] is predicted...[when one head word] does not modify [the word predicted], it is not only

Atty. Docket No. JP920000133US1  
(590.074)

useless for the prediction of the word...but also may tend to degrade the prediction accuracy.”) (see also claim 1, emphasis added, “select[ing] a word and/or a word sequence *that has a modification relationship* with said target word...and predicting said target word *based on said word...that is selected.*”). Thus, it is clear from the language of claim 1, among other teachings of the instant disclosure, that the “bigram” method of Dekai and the “trigram” method of Chelba are not favored, either alone or in combination with a word or sequence that has a modification relationship with the target word. Rather, in the instantly claimed invention, the word or sequence of words that has a modification relationship is utilized, and the those words/sequences that do not can be disregarded.

The independent claims currently under consideration recite, *inter alia*, the selection of “a word and/or a word sequence that has a modification relationship with said target word to be predicted...” or similar language to indicate that it is the word or word sequence with a modification relationship that is utilized, not merely the preceding word or word sequence in conjunction with a word or word sequence that has a modification relationship. Thus, clearly, all of the present independent claims include the novel “modification relationship” subject matter of the present invention, which, as discussed above, is simply not taught by Chelba, Dekai, or both references taken in combination with one another.

Applicants therefore respectfully submit that the applied art does not render the present invention obvious. In light of the above, it is now appropriate to withdraw the applied obviousness rejections of claims 1-6, 8, 9 and 14-20.

Atty. Docket No. JP920000133US1  
(590.074)

Similarly, the failure of Chelba and Dekai to teach or suggest all of the presently claimed elements indicates the withdrawal of the remaining obviousness rejections is now appropriate as well (i.e. rejection of claims 10-12). Since Chelba and Dekai fail to teach or suggest to one skilled in the art "a modification relationship" as used in the present invention, and Kuhn cannot overcome the deficiencies of these references, claims 10-12, which are rejected based on the combination of Chelba, Dekai and Kuhn, should be withdrawn. That is, Kuhn fails to overcome the deficiencies of Chelba and Dekai as set forth above. Whether Kuhn discloses that for which it has been cited is immaterial at this juncture due to the failure of the references as described above; however, Applicants would like to note their traversal of Kuhn to the extent the teachings of the same teach or suggest the presently claimed invention. Thus should the need so arise the Applicants reserve the right to argue the same. Applicants would like to finally point out that there is no reasonable expectation of success in making the above modification or combination in order to meet the presently claimed subject matter, assuming, *arguendo*, the same were even possible, i.e., actually combining the inventions would not produce the claimed invention.

For the aforementioned reasons, the Applicants respectfully submit, at a minimum, the prerequisite teaching/suggestion and expectation of successes required to maintain an obviousness rejection is lacking, indicating the claimed invention is not obvious under 35 U.S.C. § 103(a). Furthermore, Applicants submit that the cited references do not teach the limitations of the claimed invention, either alone or in combination, as discussed above.

Atty. Docket No. JP920000133US1  
(590.074)

**Rejections under 35 U.S.C. § 101**

Claims 1-6, 8-12 and 14-20 stand rejected under 35 U.S.C. § 101 as directed towards non-patentable subject matter or “abstract idea.” (Office Action, page 4). Applicants respectfully request reconsideration and withdrawal of these rejections in light of the following remarks.

Even if a claims 1-6, 8-12 and 14-20 were directed towards an “abstract idea”, these claims are patentable so long as each claim is, as a whole, a practical application of that “abstract idea.” Manual of Patent Examining and Procedure (“MPEP”), Rev. 5, § 2106(IV)C(2), available at:

[http://www.uspto.gov/web/offices/pac/mpep/documents/2100\\_2106.htm](http://www.uspto.gov/web/offices/pac/mpep/documents/2100_2106.htm) (last visited July 19, 2007). A claim is directed to a practical application when it: (A) “transforms” an article to a different state; or (B) otherwise produces a useful, concrete and tangible result. *Id.* If the Examiner finds such a transformation, the Examiner shall end the inquiry. MPEP, § 2106(IV)C(2)(1).

Rather than claiming a mathematical algorithm or “abstract idea” per se, the rejected claims are directed to the practical application of word prediction in a speech recognition apparatus. The practical application and concrete result being “predicting [a] target *word* based on [the] *word and/or sequence* that is selected.” (Claim 1, emphasis added). Thus, to the extent that any “abstract idea” is included in the claims, it is employed to achieve a practical application, namely predicting the next word in a sentence.

Atty. Docket No. JP920000133US1  
(590.074)

In order to facilitate expeditious prosecution of the instant application, Applicants have amended independent claim 1 to recite, *inter alia*, "returning to a user said predicted target word." (Claim 1). The other independent claims pending at the time the current Office Action was issued, claims 4, 8, 9, and 14-20, have been amended to incorporate similar language. This language is intended to clarify that the result generated by the method and/or apparatus is physically transformed and returned to a user, yielding a concrete and tangible result. Accordingly, Applicants respectfully request that these rejections be reconsidered and withdrawn.

Furthermore new dependent claims 22 and 23 have been added and recite, *inter alia*, "wherein said returning to a user comprises displaying said predicted target word" and "wherein said arrangement which returns said predicted word to a user comprises an external storage medium for storing said predicted word", respectively. (Claims 22, 23). This language clearly indicates that the practical result of word prediction results in a language result (i.e. the predicted word) that can be physically transformed by, *inter alia*, storing the result on an external storage medium such as a flexible disk, or displaying the result to a user.

#### **Request for Telephone Interview**

Applicants respectfully request that the Examiner kindly contact the Applicants' representative at the below listed telephone number to conduct a telephone interview in the event that the claims as presented herein are not in condition for immediate allowance. The Applicants respectfully submit that this is a particularly appropriate request in light of the prosecution history of this application, in which several



Atty. Docket No. JP920000133US1  
(590.074)

amendments have been submitted, an RCE has been requested and granted, and further amendments have now been submitted.

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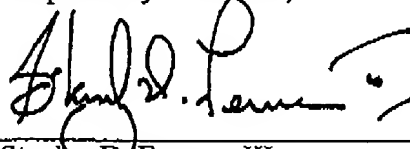
JUL 20 2007

**Conclusion**

In view of the foregoing, it is respectfully submitted that independent claims 1, 4, 8-9, and 14-20 fully distinguish over the applied art, are directed to patentable subject matter, and are thus are in condition for allowance. By virtue of dependence from what are believed to be allowable independent claims, it is respectfully submitted that claims 2-3, 5-6, 10-12, as well as new claims 22 and 23, are also presently allowable.

In summary, it is respectfully submitted that the instant application, including claims 1-6, 8-12, 14-20, 22 and 23, is presently in condition for allowance. Notice to the effect is earnestly solicited. Again, the Examiner is respectfully requested to contact the undersigned by telephone prior to the issuance of an Office Action if there are any further issues in this application.

Respectfully submitted,



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